

What is Claimed Is:

1. 1 1. A system for detecting a signal having a target frequency, comprising:
  1. 2 a first filter having a first center frequency and a first transfer function, wherein said first
  1. 3 center frequency is greater than said target frequency;
  1. 4 a second filter having a second center frequency and a second transfer function, wherein
  1. 5 said second center frequency is less than said target frequency and wherein the phases of said
  1. 6 first and second transfer functions differ by 180 degrees about said target frequency; and
  1. 7 a running cross-correlator interconnected to said first and second filters for comparing
  1. 8 said first and second transfer functions over time.
1. 1 2. The system of claim 1, wherein said running cross-correlator comprises a cross-correlator
  1. 2 having a predefined integration time interconnected to a low pass filter having a frequency that is
  1. 3 inversely proportional to said integration time of said cross-correlator.
1. 1 3. The system of claim 2, further comprising first and second saturating non-linearities
  1. 2 interconnecting said first and second filter to said cross-correlator.
1. 1 4. The system of claim 3, wherein said saturating non-linearities are signum functions.

5. A method for detecting a signal having a target frequency in wideband noise, comprising the steps of:

(a) filtering said wideband noise with a first filter having a first center frequency and a first transfer function, wherein the first center frequency is lower than said target frequency;

(b) filtering said wideband noise with a second filter having a second center frequency and a second transfer function, wherein said second center frequency is higher than said target frequency and wherein the phases of said first and second transfer functions differ by 180 degrees about said target frequency;

(c) processing the outputs of said first and second filters with a saturating non-linearity component;

(d) performing a running cross-correlation of the saturating non-linear outputs of said first and second filters; and

(e) determining said signal is present when said running cross-correlation drops below a predetermined threshold.

6. The method of claim 5, wherein the step of performing a running cross-correlation comprises providing the saturating, non-linear outputs of said first and second filters to a cross-correlator and then filtering with a low-pass filter that determines said integration time of said running cross-correlation.

7. The method of claim 6, wherein the step of processing said first and second outputs with a saturating non-linearity is performed by a signum function.